

.

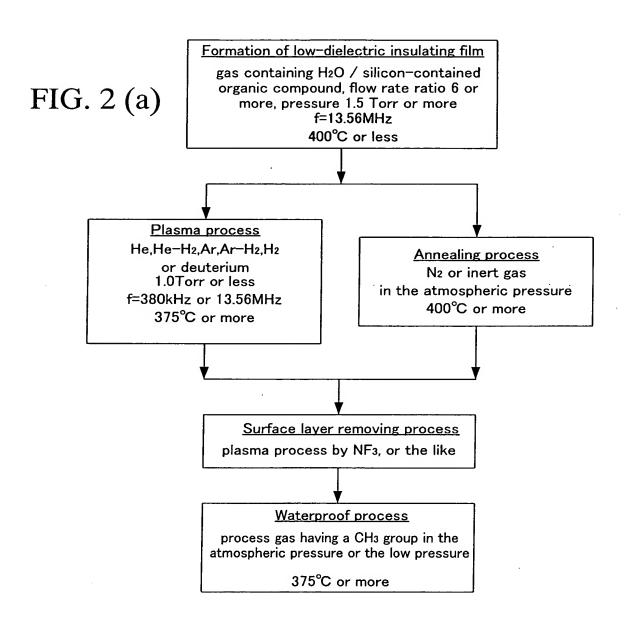


FIG. 2 (b)

Formation of Cu barrier insulating film
as containing H2Q /silicon-contained organi

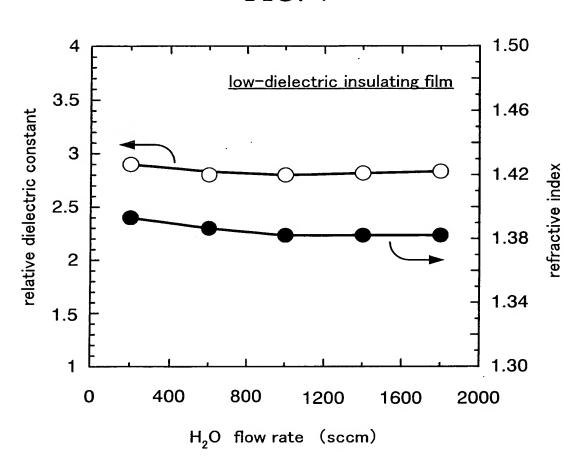
gas containing H₂O /silicon-contained organic compound, flow rate ratio 12 or more

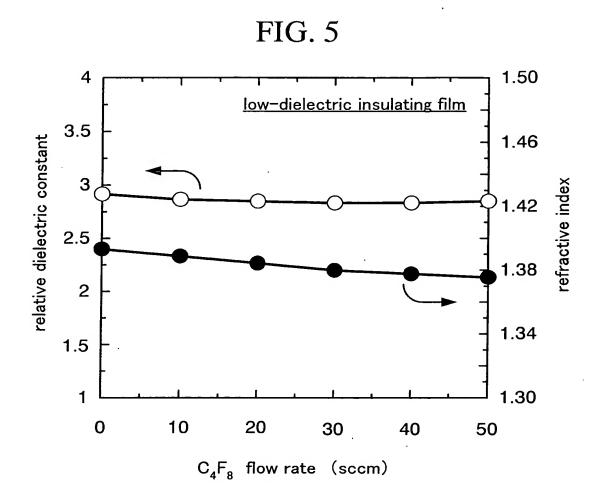
pressure below 1.0 Torr pressure 1.0 Torr or more f=380kHz f=13.56MHz

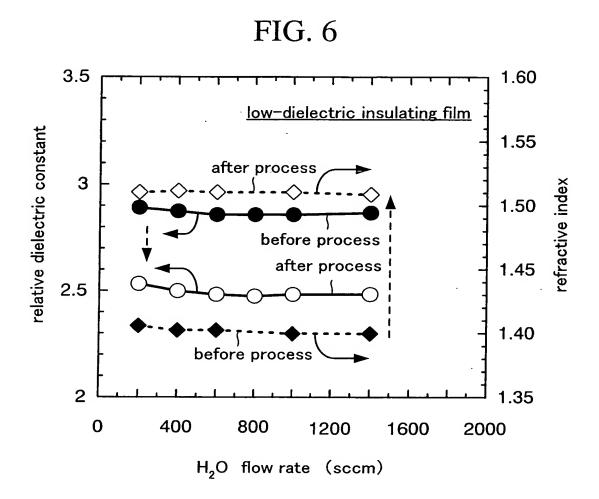
200~400°C

formed film indication	1 (2)	3(4)	3(4) 5(6)	7 (8)	9(10)	7(8) 9(10) 11(12) 13(14)	13(14)
formed film type	Low-k	Low-k	Low-k Low-k barrier barrier barrier barrier	barrier	barrier	barrier	barrier
H_2O	0	0	0	0	0	0	0
silicon-contained organic compound	0	0	0	0	0	0	0
C_xH_y , $C_xH_yF_z$, $C_xH_yB_z$	(0)	(O)	0	0	0	0	0
N ₂ O				0			0
NH3					0		0
N_2						0	
plasma process	0						
annealing process		0					
surface layer removing process	0	0					
waterproof process	(0)	0					

FIG. 4







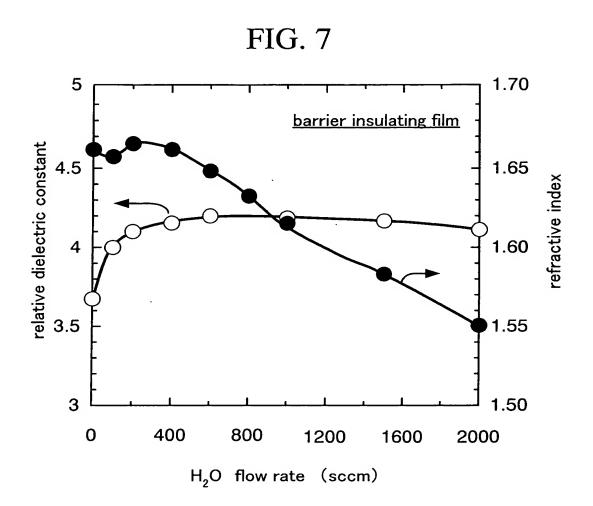
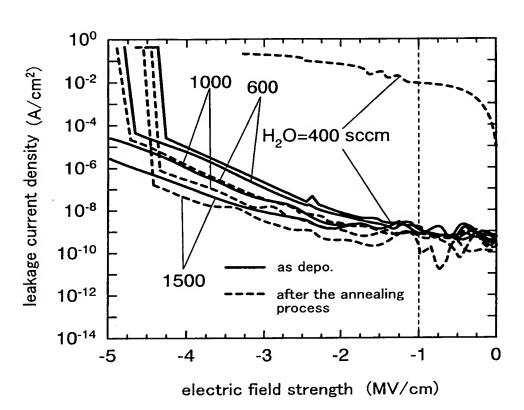
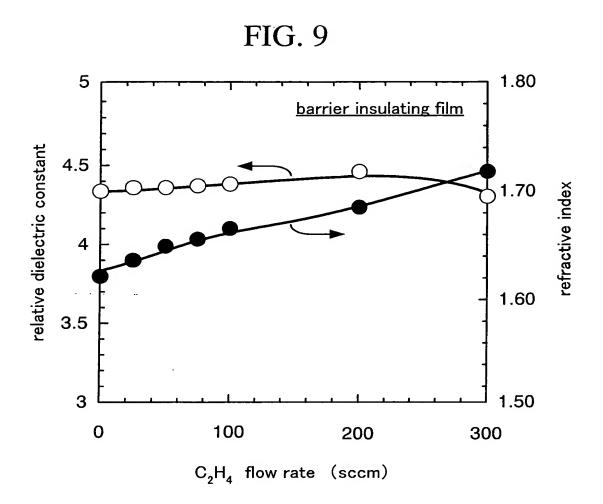


FIG. 8





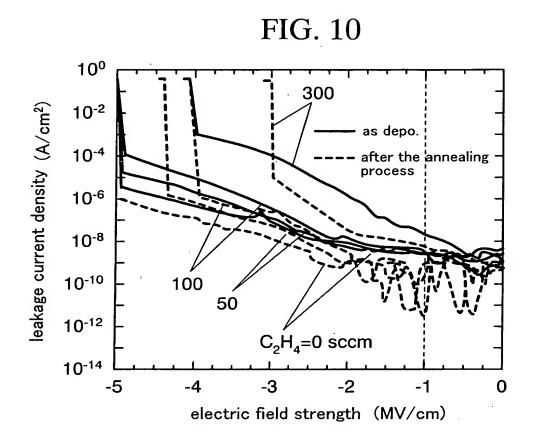
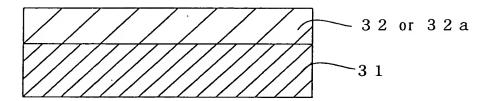
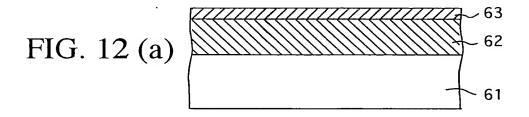
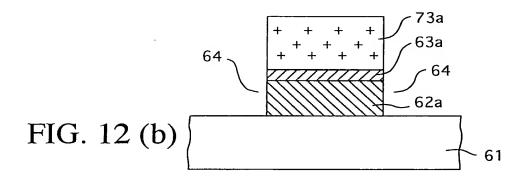
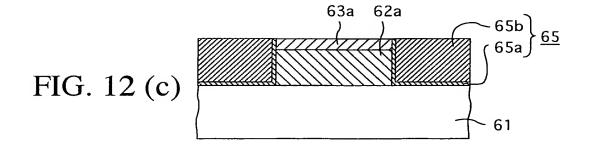


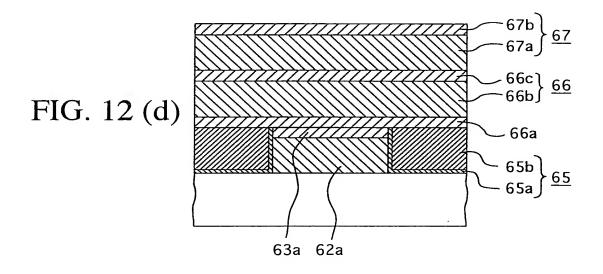
FIG. 11

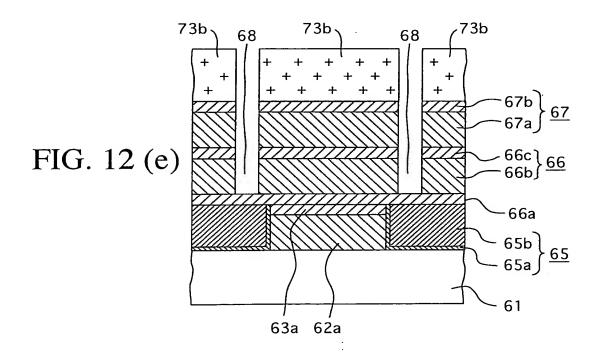


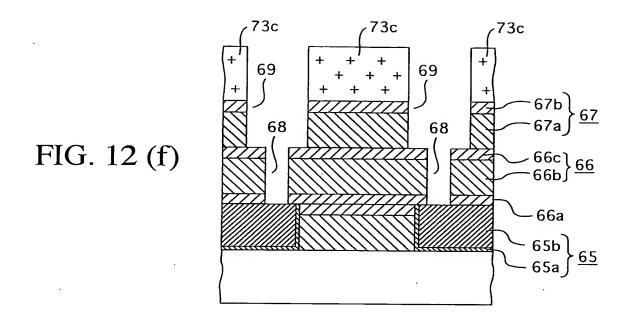












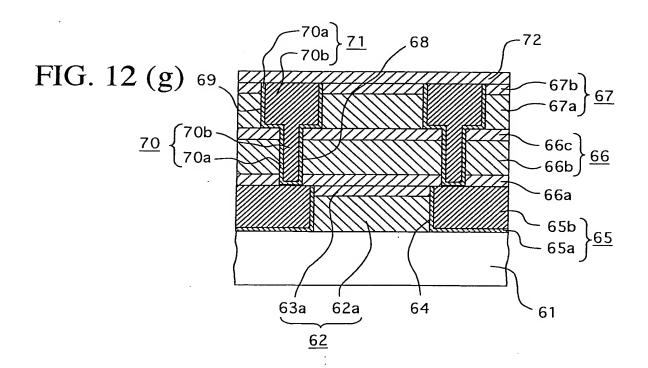


FIG. 13

